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(71)Applicant : CANON INC

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(72)Inventor : SUZUKI MARIKO
KOIKE SHOJI

(54) FABRIC FOR INK JET DYEING, PRETREATMENT AGENT FOR FABRIC, PRINTING AND PRINTED PRODUCT

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain a fabric for ink jet dyeing, capable of suppressing to the utmost a blur even if imparted with much ink, by conferring a pretreatment agent containing paraffin wax and polyethylene wax on a fabric material.

SOLUTION: First, a pretreatment agent of emulsion or aqueous solution type is prepared by mixing paraffin wax and polyethylene wax with each other in the weight ratio of (10:1) to (1:2) followed by incorporating the mixture with a nonionic surfactant such as polyoxyethylene alkylphenyl ether. Secondly, the pretreatment agent is applied to a fabric material so as to impart it with each 0.01-10 wt.% of the paraffin wax and polyethylene wax and 0.5-30 wt.% of the nonionic surfactant to afford a fabric for ink jet dyeing. Thirdly, an ink is conferred upon the fabric by such an ink jet system as to be controlled to delivery droplets of 5-200 pL. followed by subjecting the resultant fabric to color development treatment by e.g. a steaming technique, and then performing washing and drying, thus obtaining the corresponding printed product.

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CLAIMS

[Claim(s)]

[Claim 1] The textile for ink jet dyeing characterized by making a textile material contain paraffin wax and polyethylene wax.

[Claim 2] The textile for ink jet dyeing according to claim 1 which contains polyethylene wax for paraffin wax 0.01 to 10% of the weight 0.01 to 10% of the weight at least to a textile material.

[Claim 3] The textile for ink jet dyeing according to claim 2 whose mixed ratios of said paraffin wax and polyethylene wax are 10:1-1:2.

[Claim 4] The textile for ink jet dyeing according to claim 2 or 3 which uses together the Nonion system surface active agent 0.5 to 30% of the weight.

[Claim 5] The pretreatment agent for textiles characterized by containing paraffin wax and polyethylene wax in the state of an emulsion.

[Claim 6] Said pretreatment agent is a pretreatment agent for textiles according to claim 5 which consists of a water solution.

[Claim 7] The pretreatment agent for textiles containing the Nonion system surfactant according to claim 5.

[Claim 8] The textile-printing approach which gives ink to the textile for ink jet dyeing according to claim 1 with an ink jet method, and is subsequently characterized by including the process washed and dried after coloring processing.

[Claim 9] The textile-printing approach according to claim 8 using steam as said coloring processing.

[Claim 10] The textile-printing approach according to claim 8 which controls the discharged liquid drop of ink to 5 - 200pl. on the occasion of said ink grant.

[Claim 11] The textile-printing object characterized by being obtained by the approach given in claim 8 thru/or any 1 term of 10.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the textile-printing approach and the textile-printing object obtained by this using a suitable textile to print using an ink jet method, the pretreatment agent for textiles, and said textile.

[0002]

[Description of the Prior Art] There are an approach (JP,63-31594,B) of carrying out ink-jet dyeing at the cloth pretreated in the water solution which contains the water soluble polymer matter of non-dyeing property, water-soluble salts, and either of the water-insoluble nature inorganic particles in cloth as an approach of carrying out ink-jet record conventionally to the color to be used, the approach (JP,4-35351,B) of pretreating in the water solution which contains an alkaline substance, a urea or thiourea, and a water soluble polymer in cellulose fiber, carrying out ink-jet dyeing in the ink containing reactive dye, and carrying out dry-heat fixing processing, etc.

[0003] The places made into the purpose of these conventional technique or a prior technique are blot prevention of an image and obtaining a sharp pattern and a textile-printing object clear at high concentration. however, the depth of shade and clear nature comparable as the textile-printing object obtained by the conventional textile printing (screen printing) with these techniques — obtaining — it has not resulted. Since the osmosis to the thickness direction of cloth is bad, a blot when there are many homogeneity in the depth and the solid section of a color and amounts of grants of ink is a problem further again. So, the application range of a textile-printing object is narrowed.

[0004]

[Problem(s) to be Solved by the Invention] Then, its image concentration is high enough and it has the depth of a color, the purpose of this invention is excellent in the homogeneity in the solid section, and even when there are many amounts of grants of ink, it is to offer the textile-printing approach and the textile-printing object obtained by this using the textile for ink jet dyeing which can suppress generating of a blot as much as possible, the pretreatment agent for textiles, and said textile.

[0005]

[Means for Solving the Problem] The aforementioned purpose is attained by the following means.

[0006] namely, the mixing ratio of what the textile for ink jet dyeing of this invention is characterized by making a textile material contain paraffin wax and polyethylene wax, and contains polyethylene wax for paraffin wax 0.01 to 10% of the weight 0.01 to 10% of the weight at least to a textile material, said paraffin wax, and polyethylene wax — it includes that rates are 10:1-1:2 and using the Nonion system surfactant together 0.5 to 30% of the weight further.

[0007] The pretreatment agent for textiles of this invention is characterized by containing paraffin wax and polyethylene wax in the state of an emulsion, and includes what consists of a water solution, and the thing containing the Nonion system surfactant.

[0008] moreover, the thing characterized by for the textile-printing approach of this invention giving ink to the textile of this invention with an ink jet method, washing it after coloring processing subsequently, and including the process to dry — it is — the mixing ratio of said paraffin wax and

polyethylene wax — it includes that rates are 10:1–1:2 and using the Nonion system surfactant together 0.5 to 30% of the weight further. Furthermore, the textile-printing object characterized by obtaining this invention by these textile-printing approaches is proposed.

[0009] In this invention, by making a textile material contain paraffin wax and polyethylene wax, textile printing by the ink jet method is performed to this textile, image concentration is high, there is depth of a color, and the textile-printing object which the homogeneity in the solid section was excellent in, and suppressed generating of a blot as much as possible even when there were many amounts of grants of ink can be obtained.

[0010]

[Embodiment of the Invention] Hereafter, this invention is explained to a detail.

[0011] The knowledge of the ability to obtain the high-concentration image which stops a color on a textile front face, raises color enhancement, is excellent in homogeneity, and has the depth of a color when this invention persons make paraffin wax and polyethylene wax use together and contain to a textile material as a result of examination wholeheartedly was carried out.

[0012] Here, it is inadequate in an engine-performance top just to have made the textile contain only paraffin wax and polyethylene wax. By using two kinds together, the unevenness of the osmosis at the time of the adhesion unevenness and ink of a wax of a face side adhering can decrease remarkably, and dispersion at the time of coloring can be suppressed as much as possible.

[0013] 0.1 – 5% of the weight of the range is more preferably good [the content of paraffin wax] 0.05 to 8% of the weight preferably 0.01 to 10% of the weight to a textile material. The content of polyethylene wax is 0.05 – 5% of the weight of the range more preferably 0.03 to 8% of the weight 0.01 to 10% of the weight to a textile material. If any wax has more the contents than 10 % of the weight, stability at the time of making it processing liquid can be bad, and cannot make homogeneity contain in a textile. Moreover, neither of the waxes can attain effectiveness of the improvement in image concentration as the content is less than 0.01 % of the weight.

[0014] moreover — in order to make effectiveness of this invention more remarkable — the mixing ratio of paraffin wax and polyethylene wax — a rate — 10:1–1:2 — the range of 5:1–1:1 is preferably good.

[0015] Although especially the approach of giving paraffin wax and polyethylene wax does not choose a means, it makes paraffin wax and polyethylene wax an aquosity emulsion, and the approach of processing in the water solution (henceforth a pretreatment agent) which contains the emulsion at least etc. is mentioned. The putt dry cleaning method is an approach especially suitable although this invention is carried out especially.

[0016] The molecular weight etc. is not limited but a wide range thing can be used especially for the paraffin wax and polyethylene wax which are used by this invention. Furthermore, it is desirable to make one or more kinds of Nonion system surfactants use together in said pretreatment agent.

[0017] As a surface active agent of the Nonion system, polyoxyethylene alkyl ether, polyoxyethylene alkyl phenyl ether, polyoxyethylene fatty acid ester, a sorbitan fatty acid ester, polyoxyethylene sorbitan fatty acid ester, polyoxyethylene alkylamine, a glycerine fatty acid ester, oxyethylene oxypropylene block polymer, these permutation derivatives, etc. are mentioned, for example. Polyoxyethylene alkyl phenyl ether and especially polyoxyethylene sorbitan fatty acid ester are desirable especially. These activators are good to make it contain one to 20% of the weight preferably 0.5 to 30% of the weight to a textile.

[0018] Furthermore, in order to raise the effectiveness of the blot prevention at the time of performing ink jet dyeing, water-soluble mineral salt, a hydrotrope agent, a chelating agent, etc. can also be added.

[0019] Although which thing is sufficient as the textile used for the textile for ink jet textile printing of this invention, the textile which consists of cotton, silk, hemp, rayon, acetate, nylon, or polyester fiber, or the mixed textile which consists of two or more kinds of these fiber is used preferably, for example.

[0020] Next, the textile-printing approach of this invention of performing ink jet record on this textile is explained using the textile for ink jet textile printing of this invention of a configuration of having described above.

[0021] In the textile-printing approach of this invention, it is good to use the ink which the optimal color according to the above-mentioned various textiles contains. In this invention, reactive dye, acid dye, direct dye, a disperse dye, etc. are mentioned as a coloring material in usable ink. As a constituent of ink, what various additives, such as pH regulator, an antifungal agent, a surfactant, and water soluble resin, contain suitably is used, including at least the solvent object which consists of others, water or water, and a water-soluble organic solvent. [colors / these] As a water-soluble organic solvent, glycols, glycol ether, a nitrogen-containing solvent, etc. are mentioned, for example. What is necessary is for any surface active agent of the Nonion nature, anionic, cationicity, and both sexes to be usable, and just to use properly suitably [for the purpose of these] as a surface active agent.

[0022] In the ink containing a disperse dye, a dispersant is indispensable, and a ligninsulfonic acid salt, a naphthalene sulfonic-acid formalin condensate, polyoxyethylene alkyl phenyl ether, etc. are mentioned as the example.

[0023] Although an image is formed by the ink jet record approach by the textile-printing approach of this invention using ink which was described above on the textile for ink jet textile printing of this invention explained previously, image recording is performed by scanning an ink jet recording head on a textile, and giving ink to a desired location in that case. And coloring processing if needed is performed after ink jet record, subsequently, it washes and dries and the target textile-printing object is obtained. The approach that the heating coloring processing performed in the conventional textile-printing process is conventionally well-known can apply to coloring processing as it is. That is, the elevated-temperature steam method and a thermosol process are used.

[0024] Although which a well-known ink jet recording method is sufficient as the ink jet dyeing method used by this invention, its method which it is [method] the approach indicated by JP,54-59936,A, and the ink which received the operation of heat energy produces [method] a rapid volume change, and makes ink breathe out from a nozzle according to the applied force by this change of state for example is conventionally the most effective. As the reason, the above-mentioned method has small dispersion in the regurgitation rate of the ink between each nozzle, when using the recording head which has two or more nozzles, and it is mentioned that the regurgitation rate of ink is collected by the range of 5 - 20 m/sec. If ink collides on a textile at this rate, the condition of osmosis over the fiber of the drop at the time of **** is the optimal.

[0025] As ink grant conditions that the high dyeing approach of especially effectiveness is furthermore acquired by this invention, the conditions 1.5kHz or more and whose temperature of a head 2 and drive frequency are [a discharged liquid drop] 35-60 degrees C four to 40 nl/mm for the amount of 5 - 200pl. ink placing are desirable.

[0026] As an example of suitable equipment to dye using the ink of this invention, the heat energy corresponding to a record signal is given to the ink of the liquid room of a recording head, and although the equipment made to generate a drop from this heat energy is mentioned, it is explained below.

[0027] The example of a head configuration which is a part for the principal part of the equipment is shown in drawing 1 , drawing 2 , and drawing 3 .

[0028] A head 13 pastes up glass, ceramics or a plastic sheet etc. which has the slot 14 which lets ink pass, and the exoergic head 15 (although the head is shown by a diagram, not limited to this) used for dry heat record, and is obtained. The exoergic head 15 consists of a good substrate 20 of heat dissipation, such as the exoergic resistor layer 18 formed [Nichrome / the protective coat 16 formed with silicon oxide etc., the aluminum electrode 17-1, 17-2,], the accumulation layer 19, and an alumina.

[0029] Ink 21 is coming to the regurgitation orifice (micropore) 22, and forms the meniscus 23 with the pressure P.

[0030] If an electrical signal joins an electrode 17-1 and 17-2 now, **** shown by n of the exoergic head 15 generates heat rapidly, air bubbles will be generated in the ink 21 which has touched here, a meniscus 23 will serve as the record globule 24 from discharge and an orifice 22 by the pressure, and a projection and ink 21 will fly toward a textile 25. The external view of the multi-head which put in order many heads shown in drawing 1 is shown in drawing 3 . This multi-head sticks the same exoergic head 28 as the glass plate 27 which has the multi-slot 26, and the thing explained to drawing 1 , and is produced. In addition, drawing 1 is the sectional view of a head

13 along ink passage, and drawing 2 is a cutting plane in two to 2 line of drawing 1 .

[0031] An example of the ink jet recording device incorporating the head concerning drawing 4 is shown.

[0032] In drawing 4 , 61 is a blade as a wiping member, and the end is held by the blade attachment component, turns into the fixed end, and makes the gestalt of a cantilever. A blade 61 is held with the gestalt which it was arranged in the location contiguous to the record section by the recording head, and was projected in the moving trucking of a recording head in this example. 62 is a cap, it is arranged in the home position which adjoins a blade 61, moves in the direction perpendicular to the migration direction of a recording head, contacts a delivery side, and is equipped with the configuration which performs capping. Further 63 is an absorber which adjoins a blade 61 and is formed, and is held like a blade 61 with the gestalt projected in the moving trucking of a recording head. Removal of moisture, dust, etc. is performed to a delivery side by the above-mentioned blade 61, cap 62, and the absorber 63.

[0033] The recording head which records on the textile which counters the delivery side which 65 has a regurgitation energy generation means and allotted the delivery by breathing out ink, and 66 are the carriage for carrying a recording head 65 and moving a recording head 65. Carriage 66 engaged with the guide shaft 67 possible [sliding], and has connected a part of carriage 66 with the belt 69 driven by the motor 68 (un-illustrating). Thereby, carriage 66 becomes movable [in alignment with the guide shaft 67], and becomes movable [the record section by the recording head 65, and its adjoining field].

[0034] The cloth feeding section for 51 to insert a textile and 52 are cloth delivery rollers driven by the non-illustrated motor. It **** to ***** which arranged the **** roller 53 as cloth feeding of the textile is carried out by these configurations in the delivery side of a recording head, and the location which counters and record advances by them.

[0035] In case a recording head 65 returns to a home position by record termination etc. in the above-mentioned configuration, although the cap 62 of the head recovery section 64 is evacuated from the moving trucking of a recording head 65, the blade 61 is projected in moving trucking. Consequently, wiping of the delivery side of a recording head 65 is carried out. In addition, when cap 62 performs capping in contact with the delivery side of a recording head 65, cap 62 moves so that it may project in the moving trucking of a recording head.

[0036] When a recording head 65 moves to a recording start location from a home position, cap 62 and a blade 61 are in the same location as the location at the time of wiping mentioned above. Consequently, also in this migration, wiping of the delivery side of a recording head 65 is carried out.

[0037] Migration at the home position of an above-mentioned recording head moves to the home position which adjoined the record section at the predetermined spacing, not only the time of record termination and delivery recovery but while moving in the record section for record of a recording head, and the above-mentioned wiping is performed with this migration.

[0038] Drawing 5 is drawing showing an example of the ink cartridge which held the ink supplied through the ink feed zone material of a head, for example, a tube. Here, 40 is the ink hold section which held the ink for supply, for example, an ink bag, and the plug 42 made of rubber is formed at the tip. By inserting a needle (un-illustrating) in this plug 42, the ink in the ink bag 40 is closed, if supply on a head is possible. 44 is an absorber which receives waste ink. As the ink hold section, that in which the liquid-facing surface with ink is formed with polyolefine, especially polyethylene is desirable. although shown not only in that from which the head and in KUKATO ridge like the above became another object but in drawing 6 as an ink jet recording apparatus used by this invention — **** — it is used suitable also for that with which they were united.

[0039] In drawing 6 , 70 is a record unit, the ink hold section which held ink into this, for example, an ink absorber, is contained, and the ink in this ink absorber has composition breathed out as an ink droplet from the head section 71 which has two or more orifices. 72 is atmospheric-air free passage opening for making atmospheric air open the interior of a record unit for free passage. This record unit 70 is changed and used for the recording head shown by drawing 4 , and is removable to carriage 66.

[0040]

[Example] Hereafter, although an example and the example of a comparison explain this invention

still more concretely, this invention is not limited to these. In addition, unless it refuses especially, the "section" calls "% of the weight" "%" for the "weight section." The evaluation result was summarized in Table 1.

Production of the aqueosity emulsion of example 1 paraffin wax: The two sections and polyoxyethylene sorbitan palmitic-acid ester were emulsified by the one section, the 67 sections were emulsified [the 30 sections and the polyoxyethylene cetyl ether] for water with the conventional method, and paraffin wax (molecular weight 300-600) was made into the aqueosity emulsion of paraffin wax.

[0041] Production of the aqueosity emulsion of polyethylene wax: The two sections and polyoxyethylene sorbitan palmitic-acid ester were emulsified by the one section, the 67 sections were emulsified [the 30 sections and the polyoxyethylene cetyl ether] for water with the conventional method, and polyethylene wax (molecular weight 2000-3000) was made into the aqueosity emulsion of polyethylene wax.

[0042] Stirring mixing of the aqueosity emulsion of the above-mentioned paraffin wax was carried out for 3 hours in the condition of having mixed the 15 sections and bicarbonate of soda for the 2.0 sections and polyoxyethylene (n= 25) stearyl ether, having mixed [the 3.0 sections and the aqueosity emulsion of polyethylene wax] the 75.0 sections for the 5.0 sections and water, and having warmed at 50 degrees C, and the solution-like pretreatment agent was obtained. The cheesecloth of a plain weave was infiltrated (contraction percentage: 100%), this pretreatment agent was dried, and the textile for ink jet textile printing of this example was obtained. In addition, the contraction percentage (%) was searched for by the following formula.

[0043] The textile obtained by the contraction percentage (%) = [(grant weight of pretreatment agent)/(weight of cloth)] x100 above was started in the magnitude of the A4 version, and the full color print was performed using the ink of the presentation shown below using the commercial ink-jet color printer (820 Canon BJC- trade name). Moreover, respectively, after four sorts of ink adjusted each component to pH=7.0 by the sodium hydroxide after mixed stirring, with the FURORO pore filter, it filtered and it was used.

[0044]

Yellow ink - The C.I. reactive yellow 95 The eight sections - Thiodiglycol The 20 sections - A diethylene glycol The 15 sections - Ion exchange water The 57 sections Magenta ink - The C.I. reactive red 226 The eight sections - Thiodiglycol The 20 sections - The diethylene-glycol 10 section - Ion exchange water The 62 sections Cyanogen ink - C.I. reactive blue 15 The ten sections - Thiodiglycol The 20 sections - A diethylene glycol 15 sections and ion exchange water The 55 sections Black ink - The C.I. reactive black 39 The 11 section The - thiodiglycol 20 section - diethylene glycol The 15 sections - ion exchange water After 54 section print termination, immediately, at 102 degrees C, steam processing was performed for 8 minutes, and, subsequently it rinsed and dried. Consequently, on the obtained cheesecloth, the color picture of deep sufficient concentration was printed skillfully. Moreover, there is also no image nonuniformity and the sharp image was obtained.

Stirring mixing of the aqueosity emulsion of paraffin wax given in example 2 example 1 was carried out for 3 hours in the condition of having mixed the 15.0 sections and bicarbonate of soda for the 0.02 sections and polyoxyethylene (n= 25) stearyl ether, having mixed [the 0.04 sections and the aqueosity emulsion of polyethylene wax] the 79.94 sections for the 5.0 sections and water, and having warmed at 50 degrees C, and the solution-like pretreatment agent was obtained. The cheesecloth of a plain weave was infiltrated (contraction percentage: 100%), this pretreatment agent was dried, and the textile for ink jet textile printing of this example was obtained.

[0045] The textile obtained above was started in the magnitude of the A4 version, and the full color print was performed using the ink of the presentation shown in an example 1 using the commercial ink-jet color printer (620 Canon BJC- trade name).

[0046] After print termination, immediately, at 102 degrees C, steam processing was performed for 8 minutes, and, subsequently it rinsed and dried. Consequently, on the obtained cheesecloth, the color picture of deep sufficient concentration was printed skillfully. Moreover, there is also no image nonuniformity and the sharp image was obtained.

Stirring mixing of the aqueosity emulsion of paraffin wax given in example 3 example 1 was carried out for 3 hours in the condition of having mixed the 15.0 sections and bicarbonate of soda for the

25.0 sections and the polyoxyethylene (n= 50) cetyl ether, having mixed [the 32.0 sections and the aqueous emulsion of polyethylene wax] the 23.0 sections for the 5.0 sections and water, and having warmed at 50 degrees C, and the solution-like pretreatment agent was obtained. Silk was infiltrated (contraction percentage: 100%), this pretreatment agent was dried, and the textile for ink jet textile printing of this example was obtained.

[0047] The textile obtained above was started in the magnitude of the A4 version, and the full color print was performed using the ink of the presentation shown in an example 1 using the commercial ink-jet color printer (600 Canon BJC- trade name).

[0048] After print termination, immediately, at 102 degrees C, steam processing was performed for 8 minutes, and, subsequently it rinsed and dried. Consequently, on the obtained silk, the color picture of deep sufficient concentration was printed skillfully. Moreover, there is also no image nonuniformity and the sharp image was obtained.

Stirring mixing of the aqueous emulsion of paraffin wax given in example 4 example 1 was carried out for 3 hours in the condition of having mixed the 12.0 sections and bicarbonate of soda for the 0.5 sections and polyoxyethylene (n= 25) stearyl ether, having mixed [the 2.5 sections and the aqueous emulsion of polyethylene wax] the 80.0 sections for the 5.0 sections and water, and having warmed at 50 degrees C, and the solution-like pretreatment agent was obtained. The cheesecloth of a plain weave was infiltrated (contraction percentage: 100%), this pretreatment agent was dried, and the textile for ink jet textile printing of this example was obtained.

[0049] The textile obtained above was started in the magnitude of the A4 version, and the full color print was performed using the ink of the presentation shown in an example 1 using the commercial ink-jet color printer (600 Canon BJC- trade name).

[0050] After print termination, immediately, at 102 degrees C, steam processing was performed for 8 minutes, and, subsequently it rinsed and dried. Consequently, on the obtained cheesecloth, the color picture of deep sufficient concentration was printed skillfully. Moreover, there is also no image nonuniformity and the sharp image was obtained.

Stirring mixing of the aqueous emulsion of paraffin wax given in example 5 example 1 was carried out for 3 hours in the condition of having mixed the 5.0 sections and bicarbonate of soda for the 2.0 sections and the polyoxyethylene (n= 50) cetyl ether, having mixed [the 1.0 sections and the aqueous emulsion of polyethylene wax] the 87.0 sections for the 5.0 sections and water, and having warmed at 50 degrees C, and the solution-like pretreatment agent was obtained. Silk was infiltrated (contraction percentage: 100%), this pretreatment agent was dried, and the textile for ink jet textile printing of this example was obtained.

[0051] The textile obtained above was started in the magnitude of the A4 version, and the full color print was performed using the ink of the presentation shown in an example 1 using the commercial ink-jet color printer (420 Canon BJC- trade name).

[0052] After print termination, immediately, at 102 degrees C, steam processing was performed for 8 minutes, and, subsequently it rinsed and dried. Consequently, on the obtained silk, the color picture of deep sufficient concentration was printed skillfully. Moreover, there is also no image nonuniformity and the sharp image was obtained.

Stirring mixing of the aqueous emulsion of paraffin wax given in example 6 example 1 was carried out for 3 hours in the condition of having mixed the 1.0 sections and bicarbonate of soda for the 2.0 sections and polyoxyethylene (n= 50) stearyl ether, having mixed [the 3.0 sections and the aqueous emulsion of polyethylene wax] the 89.0 sections for the 5.0 sections and water, and having warmed at 50 degrees C, and the solution-like pretreatment agent was obtained. Silk was infiltrated (contraction percentage: 100%), this pretreatment agent was dried, and the textile for ink jet textile printing of this example was obtained.

[0053] The textile obtained above was started in the magnitude of the A4 version, and the full color print was performed using the ink of the presentation shown in an example 1 using the commercial ink-jet color printer (820 Canon BJC- trade name).

[0054] After print termination, immediately, at 102 degrees C, steam processing was performed for 8 minutes, and, subsequently it rinsed and dried. Consequently, on the obtained silk, the color picture of deep sufficient concentration was printed skillfully. Moreover, there is also no image nonuniformity and the sharp image was obtained.

Stirring mixing of the aqueous emulsion of paraffin wax given in example 7 example 1 was carried

out for 3 hours in the condition of having mixed the 18.0 sections and bicarbonate of soda for the 2.0 sections and the polyoxyethylene (n= 20) cetyl ether, having mixed [the 3.0 sections and the aqueous emulsion of polyethylene wax] the 72.0 sections for the 5.0 sections and water, and having warmed at 50 degrees C, and the solution-like pretreatment agent was obtained. The cheesecloth of a plain weave was infiltrated (contraction percentage: 100%), this pretreatment agent was dried, and the textile for ink jet textile printing of this example was obtained.

[0055] The textile obtained above was started in the magnitude of the A4 version, and the full color print was performed using the ink of the presentation shown in an example 1 using the commercial ink-jet color printer (820 Canon BJC- trade name).

[0056] After print termination, immediately, at 102 degrees C, steam processing was performed for 8 minutes, and, subsequently it rinsed and dried. Consequently, on the obtained cheesecloth, the color picture of deep sufficient concentration was printed skillfully. Moreover, there is also no image nonuniformity and the sharp image was obtained.

The cheesecloth for a comparison was adjusted like the example 1 except not using the aqueous emulsion of example of comparison 1 paraffin wax, and the aqueous emulsion of polyethylene wax.

[0057] The commercial ink-jet color printer (820 Canon BJC- trade name) was used for this textile, and the full color print was performed to it using the ink of the presentation shown in an example 1. After print termination, it processed like the example 1 and the textile-printing object was obtained.

[0058] Consequently, although the color picture with few blots was obtained on the obtained cheesecloth, it was not the color picture of sufficient concentration which is not clear compared with an example and is deep. The cheesecloth for a comparison was adjusted like the example 1 except not using the aqueous emulsion of example of comparison 2 paraffin wax.

[0059] The commercial ink-jet color printer (820 Canon BJC- trade name) was used for this textile, and the full color print was performed to it using the ink of the presentation shown in an example 1. After print termination, it processed like the example 1 and the textile-printing object was obtained. Consequently, although the color picture of a comparatively skillful color tone with few blots was obtained on the obtained cheesecloth, nonuniformity was looked at by especially the solid section not compared with the color picture of deep sufficient concentration but compared with the example.

The cheesecloth for a comparison was adjusted like the example 1 except not using the aqueous emulsion of example of comparison 3 polyethylene wax.

[0060] The commercial ink-jet color printer (820 Canon BJC- trade name) was used for this textile, and the full color print was performed to it using the ink of the presentation shown in an example 1. After print termination, it processed like the example 1 and the textile-printing object was obtained. Consequently, although the color picture of a comparatively skillful color tone with few blots was obtained on the obtained cheesecloth, nonuniformity was looked at by especially the solid section not compared with the color picture of deep sufficient concentration but compared with the example.

The cheesecloth for a comparison was adjusted like the example 1 except having used [the aqueous emulsion of example of comparison 4 paraffin WA@KKUSU] the 35.0 sections for the 20.0 sections and the aqueous emulsion of polyethylene wax. However, the homogeneity of processing liquid was bad, processed and ran away.

[0061] The commercial ink-jet color printer (820 Canon BJC- trade name) was used for this textile, and the full color print was performed to it using the ink of the presentation shown in an example 1. After print termination, it processed like the example 1 and the textile-printing object was obtained. Consequently, although concentration and a color picture good in depth were obtained on the obtained cheesecloth, compared with the example, nonuniformity was looked at by the solid section and it became the image which is not sharp.

The cheesecloth for a comparison was adjusted like the example 1 except having used [the aqueous emulsion of example of comparison 5 paraffin WA@KKUSU] the 10.0 sections for the 35.0 sections and the aqueous emulsion of polyethylene wax. However, the homogeneity of processing liquid was bad, processed and ran away.

[0062] The commercial ink-jet color printer (820 Canon BJC- trade name) was used for this textile, and the full color print was performed to it using the ink of the presentation shown in an

example 1. After print termination, it processed like the example 1 and the textile-printing object was obtained. Consequently, although concentration and a color picture good in depth were obtained on the obtained cheesecloth, compared with the example, nonuniformity was looked at by the solid section and it became the image which is not sharp.

[0063] The evaluation result of the above example and the example of a comparison was summarized in Table 1.

[0064]

[Table 1]

		画像濃度	シャープ度	画像ムラ (ベタ部)
実施例	1	◎	◎	◎
	2	○	◎	○
	3	◎	○	◎
	4	◎	◎	◎
	5	◎	◎	◎
	6	◎	○	◎
	7	◎	◎	◎
比較例	1	×	○	△
	2	○	○	△～×
	3	○	○	×
	4	○	△	×
	5	○	△	×

(註) ◎：特に良好 ○：良好 △：問題あり ×：不可

[0065]

[Effect of the Invention] As explained above, when an image is formed on the textile which consists of various fiber using an ink jet recording device according to this invention, it is clear, and is deep and it becomes possible to form a high-concentration image without nonuniformity.

[0066] Moreover, according to this invention, also with the usual ink jet printer marketed as the object for office, or an object for personal, it is deep and the textile-printing object with which coloring concentration consists of various clear high and fiber can be obtained easily.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the textile-printing approach and the textile-printing object obtained by this using a suitable textile to print using an ink jet method, the pretreatment agent for textiles, and said textile.

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PRIOR ART

[Description of the Prior Art] There are an approach (JP,63-31594,B) of carrying out ink-jet dyeing at the cloth pretreated in the water solution which contains the water soluble polymer matter of non-dyeing property, water-soluble salts, and either of the water-insoluble nature inorganic particles in cloth as an approach of carrying out ink-jet record conventionally to the color to be used, the approach (JP,4-35351,B) of pretreating in the water solution which contains an alkaline substance, a urea or thiourea, and a water soluble polymer in cellulose fiber, carrying out ink-jet dyeing in the ink containing reactive dye, and carrying out dry-heat fixing processing, etc.

[0003] The places made into the purpose of these conventional technique or a prior technique are blot prevention of an image and obtaining a sharp pattern and a textile-printing object clear at high concentration. however, the depth of shade and clear nature comparable as the textile-printing object obtained by the conventional textile printing (screen printing) with these techniques — obtaining — it has not resulted. Since the osmosis to the thickness direction of cloth is bad, a blot when there are many homogeneity in the depth and the solid section of a color and amounts of grants of ink is a problem further again. So, the application range of a textile-printing object is narrowed.

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EFFECT OF THE INVENTION

[Effect of the Invention] As explained above, when an image is formed on the textile which consists of various fiber using an ink jet recording device according to this invention, it is clear, and is deep and it becomes possible to form a high-concentration image without nonuniformity. [0066] Moreover, according to this invention, also with the usual ink jet printer marketed as the object for office, or an object for personal, it is deep and the textile-printing object with which coloring concentration consists of various clear high and fiber can be obtained easily.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] Then, its image concentration is high enough and it has the depth of a color, the purpose of this invention is excellent in the homogeneity in the solid section, and even when there are many amounts of grants of ink, it is to offer the textile-printing approach and the textile-printing object obtained by this using the textile for ink jet dyeing which can suppress generating of a blot as much as possible, the pretreatment agent for textiles, and said textile.

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MEANS

[Means for Solving the Problem] The aforementioned purpose is attained by the following means.

[0006] namely, the mixing ratio of what the textile for ink jet dyeing of this invention is characterized by making a textile material contain paraffin wax and polyethylene wax, and contains polyethylene wax for paraffin wax 0.01 to 10% of the weight 0.01 to 10% of the weight at least to a textile material, said paraffin wax, and polyethylene wax — it includes that rates are 10:1–1:2 and using the Nonion system surfactant together 0.5 to 30% of the weight further.

[0007] The pretreatment agent for textiles of this invention is characterized by containing paraffin wax and polyethylene wax in the state of an emulsion, and includes what consists of a water solution, and the thing containing the Nonion system surfactant.

[0008] moreover, the thing characterized by for the textile–printing approach of this invention giving ink to the textile of this invention with an ink jet method, washing it after coloring processing subsequently, and including the process to dry — it is — the mixing ratio of said paraffin wax and polyethylene wax — it includes that rates are 10:1–1:2 and using the Nonion system surfactant together 0.5 to 30% of the weight further. Furthermore, the textile–printing object characterized by obtaining this invention by these textile–printing approaches is proposed.

[0009] In this invention, by making a textile material contain paraffin wax and polyethylene wax, textile printing by the ink jet method is performed to this textile, image concentration is high, there is depth of a color, and the textile–printing object which the homogeneity in the solid section was excellent in, and suppressed generating of a blot as much as possible even when there were many amounts of grants of ink can be obtained.

[0010]

[Embodiment of the Invention] Hereafter, this invention is explained to a detail.

[0011] The knowledge of the ability to obtain the high–concentration image which stops a color on a textile front face, raises color enhancement, is excellent in homogeneity, and has the depth of a color when this invention persons make paraffin wax and polyethylene wax use together and contain to a textile material as a result of examination wholeheartedly was carried out.

[0012] Here, it is inadequate in an engine–performance top just to have made the textile contain only paraffin wax and polyethylene wax. By using two kinds together, the unevenness of the osmosis at the time of the adhesion unevenness and ink of a wax of a face side adhering can decrease remarkably, and dispersion at the time of coloring can be suppressed as much as possible.

[0013] 0.1 – 5% of the weight of the range is more preferably good [the content of paraffin wax] 0.05 to 8% of the weight preferably 0.01 to 10% of the weight to a textile material. The content of polyethylene wax is 0.05 – 5% of the weight of the range more preferably 0.03 to 8% of the weight 0.01 to 10% of the weight to a textile material. If any wax has more the contents than 10 % of the weight, stability at the time of making it processing liquid can be bad, and cannot make homogeneity contain in a textile. Moreover, neither of the waxes can attain effectiveness of the improvement in image concentration as the content is less than 0.01 % of the weight.

[0014] moreover — in order to make effectiveness of this invention more remarkable — the mixing ratio of paraffin wax and polyethylene wax — a rate — 10:1–1:2 — the range of 5:1–1:1 is preferably good.

[0015] Although especially the approach of giving paraffin wax and polyethylene wax does not

choose a means, it makes paraffin wax and polyethylene wax an aqueous emulsion, and the approach of processing in the water solution (henceforth a pretreatment agent) which contains the emulsion at least etc. is mentioned. The putty dry cleaning method is an approach especially suitable although this invention is carried out especially.

[0016] The molecular weight etc. is not limited but a wide range thing can be used especially for the paraffin wax and polyethylene wax which are used by this invention. Furthermore, it is desirable to make one or more kinds of Nonion system surfactants use together in said pretreatment agent.

[0017] As a surface active agent of the Nonion system, polyoxyethylene alkyl ether, polyoxyethylene alkyl phenyl ether, polyoxyethylene fatty acid ester, a sorbitan fatty acid ester, polyoxyethylene sorbitan fatty acid ester, polyoxyethylene alkylamine, a glycerine fatty acid ester, oxyethylene oxypropylene block polymer, these permutation derivatives, etc. are mentioned, for example. Polyoxyethylene alkyl phenyl ether and especially polyoxyethylene sorbitan fatty acid ester are desirable especially. These activators are good to make it contain one to 20% of the weight preferably 0.5 to 30% of the weight to a textile.

[0018] Furthermore, in order to raise the effectiveness of the blot prevention at the time of performing ink jet dyeing, water-soluble mineral salt, a hydrotrope agent, a chelating agent, etc. can also be added.

[0019] Although which thing is sufficient as the textile used for the textile for ink jet textile printing of this invention, the textile which consists of cotton, silk, hemp, rayon, acetate, nylon, or polyester fiber, or the mixed textile which consists of two or more kinds of these fiber is used preferably, for example.

[0020] Next, the textile-printing approach of this invention of performing ink jet record on this textile is explained using the textile for ink jet textile printing of this invention of a configuration of having described above.

[0021] In the textile-printing approach of this invention, it is good to use the ink which the optimal color according to the above-mentioned various textiles contains. In this invention, reactive dye, acid dye, direct dye, a disperse dye, etc. are mentioned as a coloring material in usable ink. As a constituent of ink, what various additives, such as pH regulator, an antifungal agent, a surfactant, and water soluble resin, contain suitably is used, including at least the solvent object which consists of others, water or water, and a water-soluble organic solvent. [colors / these] As a water-soluble organic solvent, glycols, glycol ether, a nitrogen-containing solvent, etc. are mentioned, for example. What is necessary is for any surface active agent of the Nonion nature, anionic, cationic, and both sexes to be usable, and just to use properly suitably [for the purpose of these] as a surface active agent.

[0022] In the ink containing a disperse dye, a dispersant is indispensable, and a ligninsulfonic acid salt, a naphthalene sulfonic-acid formalin condensate, polyoxyethylene alkyl phenyl ether, etc. are mentioned as the example.

[0023] Although an image is formed by the ink jet record approach by the textile-printing approach of this invention using ink which was described above on the textile for ink jet textile printing of this invention explained previously, image recording is performed by scanning an ink jet recording head on a textile, and giving ink to a desired location in that case. And coloring processing if needed is performed after ink jet record, subsequently, it washes and dries and the target textile-printing object is obtained. The approach that the heating coloring processing performed in the conventional textile-printing process is conventionally well-known can apply to coloring processing as it is. That is, the elevated-temperature steam method and a thermosol process are used.

[0024] Although which a well-known ink jet recording method is sufficient as the ink jet dyeing method used by this invention, its method which it is [method] the approach indicated by JP,54-59936,A, and the ink which received the operation of heat energy produces [method] a rapid volume change, and makes ink breathe out from a nozzle according to the applied force by this change of state for example is conventionally the most effective. As the reason, the above-mentioned method has small dispersion in the regurgitation rate of the ink between each nozzle, when using the recording head which has two or more nozzles, and it is mentioned that the regurgitation rate of ink is collected by the range of 5 - 20 m/sec. If ink collides on a textile at this rate, the condition of osmosis over the fiber of the drop at the time of **** is the optimal.

[0025] As ink grant conditions that the high dyeing approach of especially effectiveness is furthermore acquired by this invention, the conditions 1.5kHz or more and whose temperature of a head 2 and drive frequency are [a discharged liquid drop] 35–60 degrees C four to 40 nl/mm for the amount of 5 – 200pl. ink placing are desirable.

[0026] As an example of suitable equipment to dye using the ink of this invention, the heat energy corresponding to a record signal is given to the ink of the liquid room of a recording head, and although the equipment made to generate a drop from this heat energy is mentioned, it is explained below.

[0027] The example of a head configuration which is a part for the principal part of the equipment is shown in drawing 1 , drawing 2 , and drawing 3 .

[0028] A head 13 pastes up glass, ceramics or a plastic sheet etc. which has the slot 14 which lets ink pass, and the exoergic head 15 (although the head is shown by a diagram, not limited to this) used for dry heat record, and is obtained. The exoergic head 15 consists of a good substrate 20 of heat dissipation, such as the exoergic resistor layer 18 formed [Nichrome / the protective coat 16 formed with silicon oxide etc., the aluminum electrode 17–1, 17–2,], the accumulation layer 19, and an alumina.

[0029] Ink 21 is coming to the regurgitation orifice (micropore) 22, and forms the meniscus 23 with the pressure P.

[0030] If an electrical signal joins an electrode 17–1 and 17–2 now, **** shown by n of the exoergic head 15 generates heat rapidly, air bubbles will be generated in the ink 21 which has touched here, a meniscus 23 will serve as the record globule 24 from discharge and an orifice 22 by the pressure, and a projection and ink 21 will fly toward a textile 25. The external view of the multi-head which put in order many heads shown in drawing 1 is shown in drawing 3 . This multi-head sticks the same exoergic head 28 as the glass plate 27 which has the multi-slot 26, and the thing explained to drawing 1 , and is produced. In addition, drawing 1 is the sectional view of a head 13 along ink passage, and drawing 2 is a cutting plane in two to 2 line of drawing 1 .

[0031] An example of the ink jet recording device incorporating the head concerning drawing 4 is shown.

[0032] In drawing 4 , 61 is a blade as a wiping member, and the end is held by the blade attachment component, turns into the fixed end, and makes the gestalt of a cantilever. A blade 61 is held with the gestalt which it was arranged in the location contiguous to the record section by the recording head, and was projected in the moving trucking of a recording head in this example. 62 is a cap, it is arranged in the home position which adjoins a blade 61, moves in the direction perpendicular to the migration direction of a recording head, contacts a delivery side, and is equipped with the configuration which performs capping. Further 63 is an absorber which adjoins a blade 61 and is formed, and is held like a blade 61 with the gestalt projected in the moving trucking of a recording head. Removal of moisture, dust, etc. is performed to a delivery side by the above-mentioned blade 61, cap 62, and the absorber 63.

[0033] The recording head which records on the textile which counters the delivery side which 65 has a regurgitation energy generation means and allotted the delivery by breathing out ink, and 66 are the carriage for carrying a recording head 65 and moving a recording head 65. Carriage 66 engaged with the guide shaft 67 possible [sliding], and has connected a part of carriage 66 with the belt 69 driven by the motor 68 (un-illustrating). Thereby, carriage 66 becomes movable [in alignment with the guide shaft 67], and becomes movable [the record section by the recording head 65, and its adjoining field].

[0034] The cloth feeding section for 51 to insert a textile and 52 are cloth delivery rollers driven by the non-illustrated motor. It **** to ***** which arranged the **** roller 53 as cloth feeding of the textile is carried out by these configurations in the delivery side of a recording head, and the location which counters and record advances by them.

[0035] In case a recording head 65 returns to a home position by record termination etc. in the above-mentioned configuration, although the cap 62 of the head recovery section 64 is evacuated from the moving trucking of a recording head 65, the blade 61 is projected in moving trucking. Consequently, wiping of the delivery side of a recording head 65 is carried out. In addition, when cap 62 performs capping in contact with the delivery side of a recording head 65, cap 62 moves so that it may project in the moving trucking of a recording head.

[0036] When a recording head 65 moves to a recording start location from a home position, cap 62 and a blade 61 are in the same location as the location at the time of wiping mentioned above. Consequently, also in this migration, wiping of the delivery side of a recording head 65 is carried out.

[0037] Migration at the home position of an above-mentioned recording head moves to the home position which adjoined the record section at the predetermined spacing, not only the time of record termination and delivery recovery but while moving in the record section for record of a recording head, and the above-mentioned wiping is performed with this migration.

[0038] Drawing 5 is drawing showing an example of the ink cartridge which held the ink supplied through the ink feed zone material of a head, for example, a tube. Here, 40 is the ink hold section which held the ink for supply, for example, an ink bag, and the plug 42 made of rubber is formed at the tip. By inserting a needle (un-illustrating) in this plug 42, the ink in the ink bag 40 is closed, if supply on a head is possible. 44 is an absorber which receives waste ink. As the ink hold section, that in which the liquid-facing surface with ink is formed with polyolefine, especially polyethylene is desirable. although shown not only in that from which the head and in KUKATO ridge like the above became another object but in drawing 6 as an ink jet recording apparatus used by this invention — **** — it is used suitable also for that with which they were united.

[0039] In drawing 6 , 70 is a record unit, the ink hold section which held ink into this, for example, an ink absorber, is contained, and the ink in this ink absorber has composition breathed out as an ink droplet from the head section 71 which has two or more orifices. 72 is atmospheric-air free passage opening for making atmospheric air open the interior of a record unit for free passage. This record unit 70 is changed and used for the recording head shown by drawing 4 , and is removable to carriage 66.

[Translation done.]

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EXAMPLE

[Example] Hereafter, although an example and the example of a comparison explain this invention still more concretely, this invention is not limited to these. In addition, unless it refuses especially, the "section" calls "% of the weight" "%" for the "weight section." The evaluation result was summarized in Table 1.

Production of the aqueous emulsion of example 1 paraffin wax: The two sections and polyoxyethylene sorbitan palmitic-acid ester were emulsified by the one section, the 67 sections were emulsified [the 30 sections and the polyoxyethylene cetyl ether] for water with the conventional method, and paraffin wax (molecular weight 300-600) was made into the aqueous emulsion of paraffin wax.

[0041] Production of the aqueous emulsion of polyethylene wax: The two sections and polyoxyethylene sorbitan palmitic-acid ester were emulsified by the one section, the 67 sections were emulsified [the 30 sections and the polyoxyethylene cetyl ether] for water with the conventional method, and polyethylene wax (molecular weight 2000-3000) was made into the aqueous emulsion of polyethylene wax.

[0042] Stirring mixing of the aqueous emulsion of the above-mentioned paraffin wax was carried out for 3 hours in the condition of having mixed the 15 sections and bicarbonate of soda for the 2.0 sections and polyoxyethylene (n= 25) stearyl ether, having mixed [the 3.0 sections and the aqueous emulsion of polyethylene wax] the 75.0 sections for the 5.0 sections and water, and having warmed at 50 degrees C, and the solution-like pretreatment agent was obtained. The cheesecloth of a plain weave was infiltrated (contraction percentage: 100%), this pretreatment agent was dried, and the textile for ink jet textile printing of this example was obtained. In addition, the contraction percentage (%) was searched for by the following formula.

[0043] The textile obtained by the contraction percentage (%) = [(grant weight of pretreatment agent)/(weight of cloth)] x100 above was started in the magnitude of the A4 version, and the full color print was performed using the ink of the presentation shown below using the commercial ink-jet color printer (820 Canon BJC- trade name). Moreover, respectively, after four sorts of ink adjusted each component to pH=7.0 by the sodium hydroxide after mixed stirring, with the FURORO pore filter, it filtered and it was used.

[0044]

Yellow ink - The C.I. reactive yellow 95 The eight sections - Thiodiglycol The 20 sections - A diethylene glycol The 15 sections - Ion exchange water The 57 sections Magenta ink - The C.I. reactive red 226 The eight sections - Thiodiglycol The 20 sections - The diethylene-glycol 10 section - Ion exchange water The 62 sections Cyanogen ink - C.I. reactive blue 15 The ten sections - Thiodiglycol The 20 sections - A diethylene glycol 15 sections and ion exchange water The 55 sections Black ink - The C.I. reactive black 39 The 11 section The - thiodiglycol 20 section - diethylene glycol The 15 sections - ion exchange water After 54 section print termination, immediately, at 102 degrees C, steam processing was performed for 8 minutes, and, subsequently it rinsed and dried. Consequently, on the obtained cheesecloth, the color picture of deep sufficient concentration was printed skillfully. Moreover, there is also no image nonuniformity and the sharp image was obtained.

Stirring mixing of the aqueous emulsion of paraffin wax given in example 2 example 1 was carried out for 3 hours in the condition of having mixed the 15.0 sections and bicarbonate of soda for the

0.02 sections and polyoxyethylene (n= 25) stearyl ether, having mixed [the 0.04 sections and the aqueous emulsion of polyethylene wax] the 79.94 sections for the 5.0 sections and water, and having warmed at 50 degrees C, and the solution-like pretreatment agent was obtained. The cheesecloth of a plain weave was infiltrated (contraction percentage: 100%), this pretreatment agent was dried, and the textile for ink jet textile printing of this example was obtained.

[0045] The textile obtained above was started in the magnitude of the A4 version, and the full color print was performed using the ink of the presentation shown in an example 1 using the commercial ink-jet color printer (620 Canon BJC- trade name).

[0046] After print termination, immediately, at 102 degrees C, steam processing was performed for 8 minutes, and, subsequently it rinsed and dried. Consequently, on the obtained cheesecloth, the color picture of deep sufficient concentration was printed skillfully. Moreover, there is also no image nonuniformity and the sharp image was obtained.

Stirring mixing of the aqueous emulsion of paraffin wax given in example 3 example 1 was carried out for 3 hours in the condition of having mixed the 15.0 sections and bicarbonate of soda for the 25.0 sections and the polyoxyethylene (n= 50) cetyl ether, having mixed [the 32.0 sections and the aqueous emulsion of polyethylene wax] the 23.0 sections for the 5.0 sections and water, and having warmed at 50 degrees C, and the solution-like pretreatment agent was obtained. Silk was infiltrated (contraction percentage: 100%), this pretreatment agent was dried, and the textile for ink jet textile printing of this example was obtained.

[0047] The textile obtained above was started in the magnitude of the A4 version, and the full color print was performed using the ink of the presentation shown in an example 1 using the commercial ink-jet color printer (600 Canon BJC- trade name).

[0048] After print termination, immediately, at 102 degrees C, steam processing was performed for 8 minutes, and, subsequently it rinsed and dried. Consequently, on the obtained silk, the color picture of deep sufficient concentration was printed skillfully. Moreover, there is also no image nonuniformity and the sharp image was obtained.

Stirring mixing of the aqueous emulsion of paraffin wax given in example 4 example 1 was carried out for 3 hours in the condition of having mixed the 12.0 sections and bicarbonate of soda for the 0.5 sections and polyoxyethylene (n= 25) stearyl ether, having mixed [the 2.5 sections and the aqueous emulsion of polyethylene wax] the 80.0 sections for the 5.0 sections and water, and having warmed at 50 degrees C, and the solution-like pretreatment agent was obtained. The cheesecloth of a plain weave was infiltrated (contraction percentage: 100%), this pretreatment agent was dried, and the textile for ink jet textile printing of this example was obtained.

[0049] The textile obtained above was started in the magnitude of the A4 version, and the full color print was performed using the ink of the presentation shown in an example 1 using the commercial ink-jet color printer (600 Canon BJC- trade name).

[0050] After print termination, immediately, at 102 degrees C, steam processing was performed for 8 minutes, and, subsequently it rinsed and dried. Consequently, on the obtained cheesecloth, the color picture of deep sufficient concentration was printed skillfully. Moreover, there is also no image nonuniformity and the sharp image was obtained.

Stirring mixing of the aqueous emulsion of paraffin wax given in example 5 example 1 was carried out for 3 hours in the condition of having mixed the 5.0 sections and bicarbonate of soda for the 2.0 sections and the polyoxyethylene (n= 50) cetyl ether, having mixed [the 1.0 sections and the aqueous emulsion of polyethylene wax] the 87.0 sections for the 5.0 sections and water, and having warmed at 50 degrees C, and the solution-like pretreatment agent was obtained. Silk was infiltrated (contraction percentage: 100%), this pretreatment agent was dried, and the textile for ink jet textile printing of this example was obtained.

[0051] The textile obtained above was started in the magnitude of the A4 version, and the full color print was performed using the ink of the presentation shown in an example 1 using the commercial ink-jet color printer (420 Canon BJC- trade name).

[0052] After print termination, immediately, at 102 degrees C, steam processing was performed for 8 minutes, and, subsequently it rinsed and dried. Consequently, on the obtained silk, the color picture of deep sufficient concentration was printed skillfully. Moreover, there is also no image nonuniformity and the sharp image was obtained.

Stirring mixing of the aqueous emulsion of paraffin wax given in example 6 example 1 was carried

out for 3 hours in the condition of having mixed the 1.0 sections and bicarbonate of soda for the 2.0 sections and polyoxyethylene (n= 50) stearyl ether, having mixed [the 3.0 sections and the aqueous emulsion of polyethylene wax] the 89.0 sections for the 5.0 sections and water, and having warmed at 50 degrees C, and the solution-like pretreatment agent was obtained. Silk was infiltrated (contraction percentage: 100%), this pretreatment agent was dried, and the textile for ink jet textile printing of this example was obtained.

[0053] The textile obtained above was started in the magnitude of the A4 version, and the full color print was performed using the ink of the presentation shown in an example 1 using the commercial ink-jet color printer (820 Canon BJC- trade name).

[0054] After print termination, immediately, at 102 degrees C, steam processing was performed for 8 minutes, and, subsequently it rinsed and dried. Consequently, on the obtained silk, the color picture of deep sufficient concentration was printed skillfully. Moreover, there is also no image nonuniformity and the sharp image was obtained.

Stirring mixing of the aqueous emulsion of paraffin wax given in example 7 example 1 was carried out for 3 hours in the condition of having mixed the 18.0 sections and bicarbonate of soda for the 2.0 sections and the polyoxyethylene (n= 20) cetyl ether, having mixed [the 3.0 sections and the aqueous emulsion of polyethylene wax] the 72.0 sections for the 5.0 sections and water, and having warmed at 50 degrees C, and the solution-like pretreatment agent was obtained. The cheesecloth of a plain weave was infiltrated (contraction percentage: 100%), this pretreatment agent was dried, and the textile for ink jet textile printing of this example was obtained.

[0055] The textile obtained above was started in the magnitude of the A4 version, and the full color print was performed using the ink of the presentation shown in an example 1 using the commercial ink-jet color printer (820 Canon BJC- trade name).

[0056] After print termination, immediately, at 102 degrees C, steam processing was performed for 8 minutes, and, subsequently it rinsed and dried. Consequently, on the obtained cheesecloth, the color picture of deep sufficient concentration was printed skillfully. Moreover, there is also no image nonuniformity and the sharp image was obtained.

The cheesecloth for a comparison was adjusted like the example 1 except not using the aqueous emulsion of example of comparison 1 paraffin wax, and the aqueous emulsion of polyethylene wax.

[0057] The commercial ink-jet color printer (820 Canon BJC- trade name) was used for this textile, and the full color print was performed to it using the ink of the presentation shown in an example 1. After print termination, it processed like the example 1 and the textile-printing object was obtained.

[0058] Consequently, although the color picture with few blots was obtained on the obtained cheesecloth, it was not the color picture of sufficient concentration which is not clear compared with an example and is deep. The cheesecloth for a comparison was adjusted like the example 1 except not using the aqueous emulsion of example of comparison 2 paraffin wax.

[0059] The commercial ink-jet color printer (820 Canon BJC- trade name) was used for this textile, and the full color print was performed to it using the ink of the presentation shown in an example 1. After print termination, it processed like the example 1 and the textile-printing object was obtained. Consequently, although the color picture of a comparatively skillful color tone with few blots was obtained on the obtained cheesecloth, nonuniformity was looked at by especially the solid section not compared with the color picture of deep sufficient concentration but compared with the example.

The cheesecloth for a comparison was adjusted like the example 1 except not using the aqueous emulsion of example of comparison 3 polyethylene wax.
 [0060] The commercial ink-jet color printer (820 Canon BJC- trade name) was used for this textile, and the full color print was performed to it using the ink of the presentation shown in an example 1. After print termination, it processed like the example 1 and the textile-printing object was obtained. Consequently, although the color picture of a comparatively skillful color tone with few blots was obtained on the obtained cheesecloth, nonuniformity was looked at by especially the solid section not compared with the color picture of deep sufficient concentration but compared with the example.

The cheesecloth for a comparison was adjusted like the example 1 except having used [the aqueous emulsion of example of comparison 4 paraffin WA@KKUSU] the 35.0 sections for the 20.0 sections and the aqueous emulsion of polyethylene wax. However, the homogeneity of processing

liquid was bad, processed and ran away.

[0061] The commercial ink-jet color printer (820 Canon BJC- trade name) was used for this textile, and the full color print was performed to it using the ink of the presentation shown in an example 1. After print termination, it processed like the example 1 and the textile-printing object was obtained. Consequently, although concentration and a color picture good in depth were obtained on the obtained cheesecloth, compared with the example, nonuniformity was looked at by the solid section and it became the image which is not sharp.

The cheesecloth for a comparison was adjusted like the example 1 except having used [the aquosity emulsion of example of comparison 5 paraffin WA@KKUSU] the 10.0 sections for the 35.0 sections and the aquosity emulsion of polyethylene wax. However, the homogeneity of processing liquid was bad, processed and ran away.

[0062] The commercial ink-jet color printer (820 Canon BJC- trade name) was used for this textile, and the full color print was performed to it using the ink of the presentation shown in an example 1. After print termination, it processed like the example 1 and the textile-printing object was obtained. Consequently, although concentration and a color picture good in depth were obtained on the obtained cheesecloth, compared with the example, nonuniformity was looked at by the solid section and it became the image which is not sharp.

[0063] The evaluation result of the above example and the example of a comparison was summarized in Table 1.

[0064]

[Table 1]

		画像濃度	シャープ度	画像ムラ (ベタ部)
実施例	1	◎	◎	◎
	2	○	◎	○
	3	◎	○	◎
	4	◎	◎	◎
	5	◎	◎	◎
	6	◎	○	◎
	7	◎	◎	◎
比較例	1	×	○	△
	2	○	○	△～×
	3	○	○	×
	4	○	△	×
	5	○	△	×

(註) ◎：特に良好 ○：良好 △：問題あり ×：不可

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is a typical sectional view along ink passage to show the example of a configuration of the ink jet head used by this invention.

[Drawing 2] The cutting plane in two to 2 line of drawing 1 is shown.

[Drawing 3] It is the ** type external view of the multi-head which put in order many heads shown in drawing 1 .

[Drawing 4] It is the perspective view showing an example incorporating an ink jet head of the ink jet recording device used by this invention.

[Drawing 5] It is the sectional view showing an example of the ink cartridge which held the ink supplied to an ink jet head.

[Drawing 6] It is the perspective view showing an example of the ink jet recording device with which the head and the ink cartridge are united.

[Description of Notations]

13 Head

14 Slot

15 28 Exoergic head

16 Protective Coat

17-1, 17-2 Aluminum electrode

18 Exoergic Resistor Layer

19 Accumulation Layer

20 Substrate

21 Ink

22 Regurgitation Orifice

23 Meniscus

24 Record Globule

25 Textile

26 Multi-Slot

27 Glass Plate

40 Ink Bag

42 Plug

44 63 Absorber

51 Cloth Feeding Section

52 Cloth Delivery Roller

53 **** Roller

61 Blade

62 Cap

64 Recovery Section

65 Recording Head

66 Carriage

67 Guide Shaft

68 Motor

69 Belt

70 Record Unit
71 Head Section
72 Atmospheric-Air Free Passage Opening

.....
[Translation done.]

* NOTICES *

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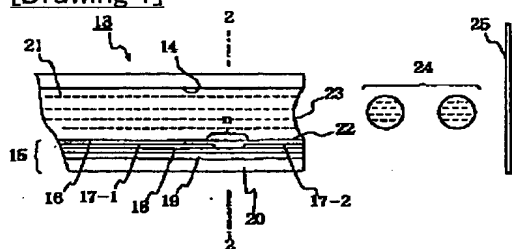
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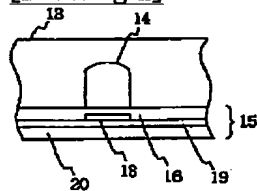
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DRAWINGS

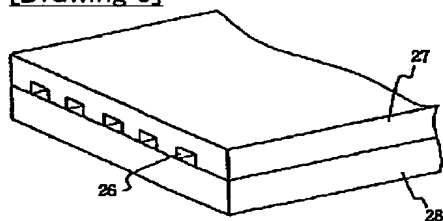
[Drawing 1]



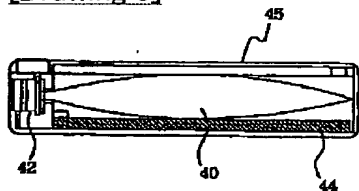
[Drawing 2]



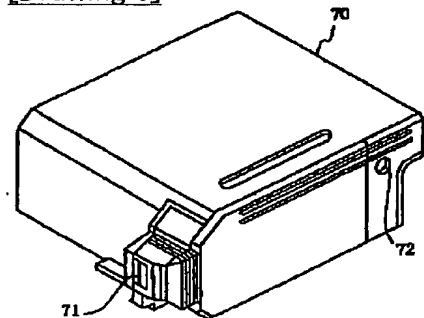
[Drawing 3]



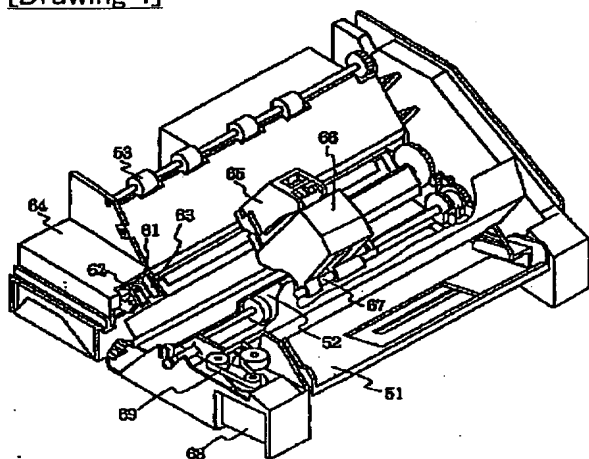
[Drawing 5]



[Drawing 6]



[Drawing 4]



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CORRECTION OR AMENDMENT

[Kind of official gazette] Printing of amendment by the convention of 2 of Article 17 of Patent Law

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112

B41J 2/01

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D06P 5/00 111 A

112

B41J 3/04 101 Z

[Procedure revision]

[Filing Date] March 7, Heisei 12 (2000. 3.7)

[Procedure amendment 1]

[Document to be Amended] Specification

[Item(s) to be Amended] The name of invention

[Method of Amendment] Modification

[Proposed Amendment]

[Title of the Invention] How to raise the manufacture approach of the pretreatment agent for the textile for ink jet dyeing, and textiles, the textile-printing approach, a textile-printing object, and a textile, and the grace of a textile-printing object

[Procedure amendment 2]

[Document to be Amended] Specification

[Item(s) to be Amended] Claim

[Method of Amendment] Modification

[Proposed Amendment]

[Claim(s)]

[Claim 1] The textile for ink jet dyeing characterized by containing 10 % of the weight for paraffin wax and polyethylene wax as an upper limit to this textile material for a textile material, respectively.

[Claim 2] The textile for ink jet dyeing according to claim 1 which contains polyethylene wax for paraffin wax 0.01 to 10% of the weight 0.01 to 10% of the weight at least to a textile material.

[Claim 3] The textile for ink jet dyeing according to claim 2 whose mixed ratios of said paraffin wax and polyethylene wax are 10:1-1:2.

[Claim 4] The textile for ink jet dyeing according to claim 2 or 3 which uses together the Nonion system surface active agent 0.5 to 30% of the weight.

[Claim 5] The textile for ink jet dyeing given in any 1 term of claims 1-4 which paraffin wax and polyethylene wax contain in this textile according to sinking in.

[Claim 6] The pretreatment agent for textiles characterized by containing paraffin wax and polyethylene wax in the state of an emulsion.

[Claim 7] Said pretreatment agent is a pretreatment agent for textiles according to claim 6 which consists of a water solution.

[Claim 8] The pretreatment agent for textiles containing the Nonion system surfactant according to claim 6.

[Claim 9] The pretreatment agent for textiles given in any 1 term of claims 6-8 which are the pretreatment agents of the textile which this pretreatment agent for textiles uses for ink jet dyeing.

[Claim 10] The textile-printing approach which gives ink to the textile for ink jet dyeing according to claim 1 with an ink jet method, and is subsequently characterized by including the process washed and dried after coloring processing.

[Claim 11] The textile-printing approach according to claim 10 using steam as said coloring processing.

[Claim 12] The textile-printing approach according to claim 11 which controls the discharged liquid drop of ink to 5 - 200pl. on the occasion of said ink grant.

[Claim 13] The textile-printing object characterized by being obtained by the approach given in claim 10 thru/or any 1 term of 12.

[Claim 14] The manufacture approach of the textile for ink jet dyeing characterized by including the process which makes a textile contain paraffin wax and polyethylene wax by making 10 % of the weight into an upper limit to a textile material according to sinking in, respectively.

[Claim 15] How to be the approach of raising the grace of the textile-printing object obtained by performing washing and desiccation after coloring processing, and raise [uses an ink jet printer for a textile and gives ink, and] the grace of the textile-printing object characterized by including the head end process which makes this textile contain 10 % of the weight for paraffin wax and polyethylene wax as an upper limit to a textile material, respectively.

[Procedure amendment 3]

[Document to be Amended] Specification

[Item(s) to be Amended] 0001

[Method of Amendment] Modification

[Proposed Amendment]

[0001]

[Field of the Invention] This invention relates to the approach of raising the manufacture approach of a suitable textile to print using an ink jet method, the pretreatment agent for textiles, the textile-printing approach using said textile, the textile-printing object obtained by this, and said textile, and the grace of a textile-printing object acquired.

[Procedure amendment 4]

[Document to be Amended] Specification

[Item(s) to be Amended] 0004

[Method of Amendment] Modification

[Proposed Amendment]

[0004]

[Problem(s) to be Solved by the Invention] Then, its image concentration is high enough and it has the depth of a color, the purpose of this invention is excellent in the homogeneity in the solid section, and even when there are many amounts of grants of ink, it is to offer the approach of raise the manufacture approach of the textile for ink-jet dyeing which can suppress generating of a blot as much as possible, the pretreatment agent for textiles, the textile-printing approach using said textile, the textile-printing object obtain by this, and said textile, and the grace of a textile-printing object acquire.

[Procedure amendment 5]

[Document to be Amended] Specification

[Item(s) to be Amended] 0006

[Method of Amendment] Modification

[Proposed Amendment]

[0006] Namely, the textile for ink jet dyeing of this invention It is what is characterized by making a textile material contain 10 % of the weight for paraffin wax and polyethylene wax as an upper limit to this textile material, respectively. As opposed to a textile material at least paraffin wax 0.01 – 10 % of the weight, The mixed ratios of what contains polyethylene wax 0.01 to 10% of the weight, said paraffin wax, and polyethylene wax are 10:1–1:2. It includes further using the Nonion system surfactant together 0.5 to 30% of the weight, and that paraffin wax and polyethylene wax contain in this textile according to sinking in.

[Procedure amendment 6]

[Document to be Amended] Specification

[Item(s) to be Amended] 0007

[Method of Amendment] Modification

[Proposed Amendment]

[0007] The pretreatment agent for textiles of this invention is characterized by containing paraffin wax and polyethylene wax in the state of an emulsion, and what consists of a water solution, the thing containing the Nonion system surface active agent, and the thing which is the pretreatment agent of the textile which this pretreatment agent uses for ink jet dyeing further are included.

[Procedure amendment 7]

[Document to be Amended] Specification

[Item(s) to be Amended] 0008

[Method of Amendment] Modification

[Proposed Amendment]

[0008] Moreover, the textile-printing approach of this invention includes controlling the discharged liquid drop of ink to 5–200pl on the occasion of it being characterized by including the process which gives ink with an ink jet method, subsequently washes after coloring processing, and is dried, and using steam for the textile of this invention as this coloring processing, and this ink grant. Furthermore, the textile-printing object characterized by obtaining this invention by these textile-printing approaches is proposed. Furthermore, the manufacture approach of the textile for ink jet dyeing characterized by this invention including the process which makes a textile contain paraffin wax and polyethylene wax by making 10 % of the weight into an upper limit to a textile material according to sinking in, respectively is proposed. Furthermore, this invention uses an ink jet printer for a textile, and gives ink, it is the approach of raising the grace of the textile-printing object obtain by performing washing and desiccation after coloring processing, and the approach of raising the grace of the textile-printing object characterize by including the head end process which makes this textile contain 10 % of the weight for paraffin wax and polyethylene wax as an upper limit to a textile material, respectively is propose.

[Translation done.]

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